

Serial No. 10/075,726

Art Unit: 1743

Applicants' Response to the Office Action dated May 25, 2005

REMARKS/ARGUMENTS

Amendment of the Claims

Claims 1-20 are currently pending in the present application. Claims 1, 6 and 18-20 are amended by adding "forms of" in the phrase "having at least two different forms of microreaction channels". Support for this amendment is found in paragraph [0006], among others, of Applicants' specification.

The other amendment to claims 1, 6, and 18-20 is to change "independent " to the adverb form "independently".

Claim 7 is amended to remove an extra comma.

Applicants submit that the amendment adds no new matter or new issues and, therefore, may properly be entered under 37 CFR 116. Entry of the amendments is therefore respectfully solicited.

Rejection for Anticipation

In the Office Action, the Examiner maintains the rejection of claims 1-6, 8 and 10-20 under 35 U.S.C. §102(e), as being anticipated by U.S. Patent Application Publication No. 20020014106A1 of Srinivasan, et al. (hereinafter referred to as "Srinivasan"). The Examiner refers to the contention in the office action of September 14, 2004 that Srinivasan discloses a microfabricated microdetection array made of a glass/silicon composition, the array having a plurality of reaction spaces. The Examiner further contends that paragraph [0046] of Srinivasan discloses the use of a silicon dioxide coating having a thickness "indistinguishable from the claimed range." (See, the office action of September 14, 2004, p. 3).

On these bases, the Examiner argues that the claims are anticipated. Applicants respectfully disagree and traverse the Examiner's rejection and the arguments and contentions set forth in support thereof.

In accordance with the foregoing amendment of claims 1, 6, and 18-20, Applicants' claimed invention is now more clearly directed to chip reactors comprising a carrier having at least two different forms of microreaction channels, each of the channels comprising at least one reaction space, at least one inlet and at least one outlet, wherein each of the channels is suitable for operation independently of the other.

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As set forth in the Specification, Applicants' invention "combines a number of possible forms of microreactor in one miniaturized structural component . . . [i]t is possible in this way to vary a number of process parameters" using a single chip reactor. (See, Applicants' Specification, p. 2, ¶ [0006]).

Thus, as set forth in the Specification,

"the new chip reactor makes it possible - by problem-free actuation of the individual microreaction spaces - to test a number of possible forms of microreaction systems for their suitability for liquid-phase reactions and optimization of the test results so that a number of experiments can be carried out far more quickly and with less outlay." (See, *id.* at ¶ [0007]).

In other words, Applicants' invention is directed to chip reactors having at least two microreaction channels that are not identically shaped. For example, in one preferred embodiment of Applicants' invention, as shown in Figure 1, a chip reactor has 19 different microreaction channels of different forms, i.e., of different geometric arrangement (or shape).

In contrast, Srinivasan is directed to a gas chromatograph which has four or more analysis channels, one for each of the four or more gas chromatography columns described therein. (See, e.g., ¶ [0008]). However, it is clear from the disclosure of Srinivasan that each of the microdetectors, or thermal conductivity sensors, is identical to the others. Thus, while the microdetectors are described as having an inlet for the gas sample, an outlet for the gas sample, and a detection cavity -- each inlet/cavity/outlet is the same.

In paragraph [0010], which describes a preferred embodiment, Srinivasan states: "Each of the six or more sample thermal conductivity sensors comprises an inlet port in fluid communication with the outlet of the gas chromatography columns for receiving a separated sample . . ." Thus, the microdetector (chambers) of Srinivasan are not reactor chambers or channels. They simply hold a sample whose thermal conductivity is being instantaneously being measured.

Thus, Srinivasan fails to teach each and every element of the claimed invention, most notably, a chip reactor comprising a carrier having at least two different forms of microreaction channels. Accordingly, Srinivasan fails to anticipate the claimed invention. Applicants therefore

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respectfully request reconsideration and withdrawal of the Examiner's rejection under 35 U.S.C. §102(e).

Rejection for Obviousness

In the Office Action, the Examiner maintains the rejection of claims 7 and 9 under 35 U.S.C. §103(a), as being unpatentable over Srinivasan, again referring to the office action of September 14, 2004. Therein, the Examiner contends that, while Srinivasan is silent as to the length of a reaction channel and the mixing angle, that such elements are simply the routine optimization of result-effective variables. On that basis, the Examiner argues that the claims are obvious. Applicants respectfully disagree and traverse the rejection and the arguments and contentions in support thereof.

As mentioned above, Applicants' claimed invention is now more clearly directed to chip reactors comprising a carrier having at least two different forms of microreaction channels, each of the channels comprising at least one reaction space, at least one inlet and at least one outlet, wherein each of the channels is suitable for operation independently of the other.

As noted above, paragraph [0010] of Srinivasan establishes that the only function of its microdetection chambers (or channels) is to detect. They are designed only to receive an already separated sample and continuously measure its thermal conductivity. Applicants submit that Srinivasan thus provides no motivation or basis to establish suitable lengths, more than on inlet or a mixing angle for Applicants' microreactors in accordance with the rejected claims 7 and 9. (Nor, does Srinivasan provide any motivation or basis for providing microreaction chambers or channels of different forms per Applicants' independent claim 1 from which claims 7 and 9 depend.)

Accordingly, Applicants submit that the Examiner has failed to establish a prima facie case of obviousness based upon Srinivasan. Reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a) are respectfully requested.

Rejection for Obviousness-Type Double Patenting

In the Office Action, the Examiner maintains the provisional rejection of claims 1-20 under the judicially created doctrine of obviousness-type double patenting as being unpatentable

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over claims 1-10 of copending U.S. patent application serial no. 10/076,736 ("the copending application"). The Examiner argues that while the claims are not identical, they are not patentably distinct from each other because both sets of claims are directed to microreactors of identical composition. Applicants respectfully traverse this rejection and the arguments and contentions set forth in support thereof.

The claims of the copending application are directed to microreactors which inhibit unwanted side reactions by being composed of an inert coating material covering the reaction surface of the microreaction system. Thus, the claims of this application are directed to a feature of the microreaction chamber which would be the same for all chambers and which is not designed to affect the form of the chamber.

The claims of the instant application, on the other hand, are directed to chip reactors comprising a carrier having at least two different forms of microreaction channels, each of the channels comprising at least one reaction space, at least one inlet and at least one outlet, wherein each of the channels is suitable for operation independently of the other.

Accordingly, Applicants submit that the instant claims are not obvious in view of the claims of the copending application, and respectfully request reconsideration by the Examiner and withdrawal of the rejection under the judicially created doctrine of obviousness-type double patenting.

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In view of the amendments and remarks set forth above, Applicants submit that all pending claims patentably distinguish over the prior art of record and known to Applicants, either alone or in combination. Accordingly, reconsideration, withdrawal of the rejections and a Notice of Allowance are respectfully requested.

Respectfully submitted,

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